REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested.

I. STATUS OF THE CLAIMS

Various of the claims are amended herein.

In view of the above, it is respectfully submitted that claims 1-42 are currently pending and under consideration.

II. REJECTION OF CLAIMS 1-42 UNDER 35 U.S.C. § 103(A) AS BEING UNPATENTABLE OVER MIYACHI ET AL. (USP# 5,920,414) IN VIEW OF HEILING ET AL. (USP# 5,136,410)

The present invention as recited, for example, in claim 1 relates to an optical sender comprising "means for shutting down said optical signal when receiving at least one of a power alarm relating to on/off of power supply and a wavelength alarm relating to the wavelength of said light beam."

Miyachi discloses a wavelength division multiplexing optical transmission apparatus provided with a control section that, in addition to a first control function of controlling the wavelength of each of the semiconductor lasers to a wavelength minimizing the loss in the optical wavelength multiplexer, has a second control means of sensing ambient temperature and controlling the optical wavelength multiplexer so that the temperature characteristic of the optical wavelength multiplexer may be compensated on the basis of fluctuations and the ambient temperature (see column 5, lines 42-51).

In item 3, on page 8 of the Office Action, the Examiner asserts that in column 6, lines 29-44, Miyachi discloses the monitoring of the injection current and the output power of semiconductor lasers. Also, the Examiner asserts that in column 16, lines 21-23, Miyachi discloses a wavelength control section that controls the wavelength of each semiconductor laser.

However, it is respectfully submitted that the monitoring of the injection current and the output power of semiconductor lasers is a different embodiment than the wavelength control section that controls the wavelength of each semiconductor laser.

For example, in column 6, lines 29-44, Miyachi discloses that a receiver section monitors

the difference between the wavelength of the semiconductor laser and a wavelength minimizing the loss in the optical wavelength demultiplexer, to thereby determine an abnormality in the semiconductor lasers. In column 16, lines 21-23, Miyachi discloses that signal-to-noise ratio measuring section 51 measures the signal-to-noise of the received signal from the optical receiver 22 and transmits a feedback control signal to the transmitter section, to thereby control the wavelength of the semiconductor laser according to the control signal.

Therefore, for example, it appears that the semiconductor lasers of Miyachi are controlled based on signals received at the **receiver section**, which differs from shutting down said optical signal when receiving at least one of a power alarm relating to on/off of power supply and a wavelength alarm relating to the wavelength of said light beam at the **optical sender**, as recited in claim 1 of the present application. Further, nothing in column 6, lines 29-44 and column 16, lines 21-23 of Miyachi suggests shutting down the semiconductor lasers. Thus, Miyachi discloses only controlling the semiconductor lasers, which is different from shutting down the optical signal at the optical sender, as recited in claim 1 of the present application.

In addition to the above comments, the present invention is patentably distinguishing over Miyachi since the claimed power alarm and wavelength alarm are provided in the optical sender. Miyachi, for example, differs from the present invention by having an alarm generator 24 provided in the receiver section R of the wavelength division multiplexing optical transmission apparatus (see column 9, lines 30-38 of Miyachi).

To clarify differences of the present invention over Miyachi, claim 1 is amended herein to recite the power alarm and the wavelength alarm being inside the optical sender. Similar amendments are made to independent claims 19, 20, 22, 40, and 41.

Heiling discloses an optical fiber link controlling safety system that easily and cost effectively detects link failures over the distances spanned by a particular link, reduces (or shuts off) the lasers radiant energy output, when a link failure is detected (see column 4, lines 19-25).

However, Heiling does not disclose any of the features as recited in claim 1 of the present application.

Therefore, neither Miyachi nor Heiling, alone or in combination, suggest or disclose any of the features as recited in claim 1 of the present application.

Independent claims 19, 20, 22, 40, and 41 set forth similar features as recited, for example, in claim 1. Therefore, Miyachi and Heiling do not suggest or disclose any of the features as recited in claims 19, 20, 22, 40, and 41.

In view of the above, it is respectfully submitted that the rejection is overcome.

III. CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that each of the claims patentably distinguishes over the prior art, and therefore defines allowable subject matter. A prompt and favorable reconsideration of the rejection along with an indication of allowability of all pending claims are therefore respectfully requested.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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Date: November 20, 2001

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please AMEND the following claims:

1. (ONCE AMENDED) An optical sender comprising:

a light source for outputting a light beam;

an optical modulator for modulating said light beam in accordance with a main signal to output an optical signal; and

means for shutting down said optical signal when receiving at least one of a power alarm relating to on/off of power supply and a wavelength alarm relating to the wavelength of said light beam, wherein said power alarm and said wavelength alarm are provided inside the optical sender.

2. (AS UNAMENDED) An optical sender according to claim 1, further comprising:

a circuit for supplying a power to said light source; and

a power supervisory circuit for monitoring on/off of supply of the power to said light source and outputting said power alarm during a given time period from a time the supply of the power to said light source becomes on or off.

3. (AS UNAMENDED) An optical sender according to claim 2, wherein said power supplying circuit comprises a constant current source.

4. (AS UNAMENDED) An optical sender according to claim 1, further comprising:

a wavelength monitor for detecting the wavelength of said light beam; and

a circuit for outputting said wavelength alarm when the wavelength detected by said wavelength monitor is deviated from a predetermined range.

5. (AS UNAMENDED) An optical sender according to claim 4, further comprising means for controlling said light source so that the wavelength detected by said wavelength monitor is maintained constant.

6. (AS UNAMENDED) An optical sender according to claim 5, wherein:

said light source comprises a laser diode; and

said controlling means comprises means for controlling the temperature of said laser diode.

7. (AS UNAMENDED) An optical sender according to claim 4, wherein said wavelength monitor is provided between said light source and said optical modulator.

8. (AS UNAMENDED) An optical sender according, to claim 4, wherein said optical modulator is provided between said light source and said wavelength monitor.

9. (AS UNAMENDED) An optical sender according to claim 4, wherein:

said light source comprises a laser diode for outputting a forward beam and a backward beam;

said forward beam being supplied to said optical modulator, said backward beam being supplied to said wavelength monitor.

10. (AS UNAMENDED) An optical sender according to claim 1, wherein said shutting down means comprises:

an optical element for receiving said optical signal output from said optical modulator; and

means for controlling said optical element so that the transmittance of said optical element is reduced when receiving at least one of said power alarm and said wavelength alarm.

11. (AS UNAMENDED) An optical sender according to claim 10, wherein said optical element is a Mach-Zehnder type lithium niobate modulator.

12. (AS UNAMENDED) An optical sender according to claim 10, wherein said optical element is a Mach-Zehnder type semiconductor modulator.

13. (AS UNAMENDED) An optical sender according to claim 10, wherein said optical element is an electroabsorption type modulator.

14. (AS UNAMENDED) An optical sender according to claim 10, wherein said optical element is a semiconductor optical amplifier.

15. (AS UNAMENDED) An optical sender according to claim 1, wherein said shutting down means comprises means for switching the operating point of said optical modulator and shutting down input of said main signal into said optical modulator when receiving at least one of said power alarm and said wavelength alarm.

16. (AS UNAMENDED) An optical sender according to claim 15, wherein said optical modulator is a Mach-Zehnder type lithium niobate modulator.

17. (AS UNAMENDED) An optical sender according to claim 15, wherein said optical modulator is a Mach-Zehnder type semiconductor modulator.

18. (AS UNAMENDED) An optical sender according to claim 15, wherein said optical modulator is an electroabsorption type modulator.

19. (ONCE AMENDED) A terminal device for wavelength division multiplexing, comprising:

a plurality of optical senders for outputting optical signals having different wavelengths; and

an optical multiplexer for receiving said optical signals to output wavelength division multiplexed signal light:

wherein each of said optical senders comprises:

a light source for outputting a light beam;

an optical modulator for modulating said light beam in accordance with a main signal to output an optical signal; and

means for shutting down said optical signal when receiving at least one of a power alarm relating to on/off of power supply and a wavelength alarm relating to the wavelength of said light beam, wherein said power alarm and said wavelength alarm are provided inside of the respective optical sender.

20. (ONCE AMENDED) An optical communication system for wavelength division multiplexing, comprising:

first and second terminal devices; and

an optical fiber transmission line for connecting said first and second terminal devices;

wherein at least one of said first and second terminal devices comprises:

a plurality of optical senders for outputting optical signals having different wavelengths; and

an optical multiplexer for receiving said optical signals to output wavelength division multiplexed signal light;

wherein each of said optical senders comprises:

a light source for outputting a light beam;

an optical modulator for modulating said light beam in accordance with a main signal to output an optical signal; and

means for shutting down said optical signal when receiving at least one of a power alarm relating to on/off of power supply and a wavelength alarm relating to the wavelength of said light beam, wherein said power alarm and said wavelength alarm are provided inside of the respective optical sender.

21. (AS UNAMENDED) An optical communication system according to claim 20, further comprising at least one optical amplifier arranged along said optical fiber transmission line.

22. (ONCE AMENDED) An optical sender comprising:

a light source outputting a light beam;

an optical modulator modulating said light beam in accordance with a main signal to output an optical signal; and

a shutting down device shutting down said optical signal when receiving at least one of a power alarm relating to on/off of power supply and a wavelength alarm relating to the wavelength of said light beam, wherein said power alarm and said wavelength alarm are provided inside the optical sender.

23. (AS UNAMENDED) An optical sender according to claim 22, further comprising:

a circuit supplying a power to said light source; and

a power supervisory circuit monitoring on/off of supply of the power to said light source and outputting said power alarm during a given time period from a time the supply of the power to said light source becomes on or off.

24. (AS UNAMENDED) An optical sender according to claim 23, wherein said power

supplying circuit comprises a constant current source.

25. (AS UNAMENDED) An optical sender according to claim 22, further comprising:

a wavelength monitor detecting the wavelength of said light beam; and

a circuit outputting said wavelength alarm when the wavelength detected by said wavelength monitor is deviated from a predetermined range.

26. (AS UNAMENDED) An optical sender according to claim 25, further comprising a first controlling device controlling said light source so that the wavelength detected by said wavelength monitor is maintained constant.

27. (AS UNAMENDED) An optical sender according to claim 26, wherein:

said light source comprises a laser diode; and

said first controlling device comprising a temperature controller controlling the temperature of said laser diode.

28. (AS UNAMENDED) An optical sender according to claim 25, wherein said wavelength monitor is provided between said light source and said optical modulator.

29. (AS UNAMENDED) An optical sender according, to claim 25, wherein said optical modulator is provided between said light source and said wavelength monitor.

30. (AS UNAMENDED) An optical sender according to claim 25, wherein:

said light source comprises a laser diode outputting a forward beam and a backward beam;

said forward beam being supplied to said optical modulator, said backward beam being supplied to said wavelength monitor.

31. (AS UNAMENDED) An optical sender according to claim 22, wherein said shutting down device comprises:

an optical element receiving said optical signal output from said optical modulator; and

a second controlling device controlling said optical element so that the transmittance of said optical element is reduced when receiving at least one of said power alarm

and said wavelength alarm.

32. (AS UNAMENDED) An optical sender according to claim 31, wherein said optical element is a Mach-Zehnder type lithium niobate modulator.

33. (AS UNAMENDED) An optical sender according to claim 31, wherein said optical element is a Mach-Zehnder type semiconductor modulator.

34. (AS UNAMENDED) An optical sender according to claim 31, wherein said optical element is an electroabsorption type modulator.

35. (AS UNAMENDED) An optical sender according to claim 31, wherein said optical element is a semiconductor optical amplifier.

36. (AS UNAMENDED) An optical sender according to claim 22, wherein said shutting down device comprises a switching device switching the operating point of said optical modulator and shutting down input of said main signal into said optical modulator when receiving at least one of said power alarm and said wavelength alarm.

37. (AS UNAMENDED) An optical sender according to claim 36, wherein said optical modulator is a Mach-Zehnder type lithium niobate modulator.

38. (AS UNAMENDED) An optical sender according to claim 36, wherein said optical modulator is a Mach-Zehnder type semiconductor modulator.

39. (AS UNAMENDED) An optical sender according to claim 36, wherein said optical modulator is an electroabsorption type modulator.

40. (ONCE AMENDED) A terminal device for wavelength division multiplexing, comprising:

a plurality of optical senders outputting optical signals having different wavelengths; and

an optical multiplexer receiving said optical signals to output wavelength division multiplexed signal light:

wherein each of said optical senders comprises:

a light source outputting a light beam;

an optical modulator modulating said light beam in accordance with a main signal to output an optical signal; and

a shutting down device shutting down said optical signal when receiving at least one of a power alarm relating to on/off of power supply and a wavelength alarm relating to the wavelength of said light beam, wherein said power alarm and said wavelength alarm are provided inside of the respective optical sender.

41. (ONCE AMENDED) An optical communication system for wavelength division multiplexing, comprising:

first and second terminal devices; and

an optical fiber transmission line connecting said first and second terminal devices;

wherein at least one of said first and second terminal devices comprises:

a plurality of optical senders outputting optical signals having different wavelengths; and

an optical multiplexer receiving said optical signals to output wavelength division multiplexed signal light;

wherein each of said optical senders comprises:

a light source outputting a light beam;

an optical modulator modulating said light beam in accordance with a main signal to output an optical signal; and

a shutting down device shutting down said optical signal when receiving at least one of a power alarm relating to on/off of power supply and a wavelength alarm relating to the wavelength of said light beam, wherein said power alarm and said wavelength alarm are provided inside of the respective optical sender.

42. (AS UNAMENDED) An optical communication system according to claim 41, further comprising at least one optical amplifier arranged along said optical fiber transmission line.